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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/661,638	09/15/2003	Jiro Hiraiwa	242742US3	8007

22850 7590 02/07/2007

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EXAMINER	
ZHENG, LOIS L	
ART UNIT	**PAPER NUMBER**
1742	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/07/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/661,638	HIRAIWA ET AL.	
	Examiner	Art Unit	
	Lois Zheng	1742	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 October 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 13 October 2006 has been entered.

Status of Claims

2. Claims 1-2 are amended in view of the amendments filed 13 October 2006. Therefore, claims 1-8 are currently under examination.

Status of Previous Rejections

3. The rejection of claims 1 under 35 U.S.C. 112, second paragraph, is withdrawn in view of applicant's claim amendments filed 13 October 2006.

Information Disclosure Statement

4. The information disclosure statement filed 13 October 2006 fails to comply with 37 CFR 1.98(a)(1), which requires the following: (1) a list of all patents, publications, applications, or other information submitted for consideration by the Office; (2) U.S. patents and U.S. patent application publications listed in a section separately from citations of other documents; (3) the application number of the application in which the information disclosure statement is being submitted on each page of the list; (4) a column that provides a blank space next to each document to be considered, for the

examiner's initials; and (5) a heading that clearly indicates that the list is an information disclosure statement. The information disclosure statement has been placed in the application file, but the information referred to therein has not been considered.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 01/77412 in view of Marumo et al. US 4,790,859(Marumo), and further in view of JP2000-160390(JP'390).

The rejection grounds are based on WO 01/77412. However, the examiner will rely on the teachings of Tojo et al. US 6,518,105 B2(Tojo'105) when discussing the details of the rejection since Tojo'105 is the National Stage Entry and an English equivalent of WO 01/77412 which is in Japanese.

Tojo'105 teaches a fluorine gas generator for generating high purity fluorine gas by electrolysis of a mixed molten-salt comprising hydrogen fluoride(abstract). The fluorine gas generator of Tojo'105 comprises an electrolytic cell which is separated into an anode chamber and a cathode chamber(abstract, Fig. 1 numerals 5 and 7). Tojo'105 further teaches that the fluorine gas generator comprises absorption towers to downstream from the hydrogen and fluorine gases outlet to remove excess HF from the

hydrogen gas and the fluorine gas(col. 6 lines 14-19). Fig. 1 of Tojo'105 appears to shown that the fluorine gas generator has box-shaped body.

However, the absorption towers of Tojo'105 do not explicitly read on the claimed first and second adsorption units. In addition, Tojo'105 does not explicitly teach the at least three compartments for housing the electrolyzer and the adsorption units.

Marumo teaches an apparatus for separating gaseous mixtures containing a first and a second gas having different chemical compositions(abstract). The gas separation apparatus of Marumo teaches using two adsorption towers to provide an efficient separation of a gas mixture(col. 2 lines 41-42, col. 11 lines 53-55). Marumo further teaches that the first adsorption tower is being used to separate the gas mixture while the adsorbent in the second adsorption tower is being regenerated. Later on, the process is switch where the second adsorption tower is used to separate the gas mixture while the adsorbent in the first adsorption tower is being regenerated(col. 12 lines 6-63).

Therefore, it would have been obvious to one of ordinary skill in the art to have incorporated the gas mixture separation apparatus of Marumo with the dual adsorption tower setup into the fluorine gas generator of Tojo'105 to remove the HF from the hydrogen gas and the fluorine gas in order to achieve efficient separation of the gas mixture as taught by Marumo and to minimize the adsorption tower down time by using one adsorption tower for gas separation while allowing the adsorbent regeneration to take place in the other adsorption tower as taught by Marumo.

JP'390 teaches placing an electrochemical plating device and the control system in separate chambers in order to avoid contamination of the electrochemical plating cell (abstract).

Therefore, it would have been obvious to one of ordinary skill in the art to have incorporated the multi-compartment housing of JP'390 into the apparatus of Tojo'105 in view of Marumo to separately house the electrolyzer, the first adsorption unit and the second adsorption unit in order to avoid cross contamination(abstract, paragraph [0017]).

Regarding claims 1-2, the fluorine gas generator of Tojo'105 in view of Marumo and JP'390 meets the limitations of the instant claims.

Regarding claim 3, Tojo'105 further teaches an exhaust opening(Fig. 1 numeral 19) to provide controlled atmosphere for the interior of the fluorine gas generator(col. 8 lines 16-18). Therefore, it would have been obvious to one of ordinary skill in the art to have incorporated an exhaust opening(i.e. suction opening) to each of the three compartments of the fluorine gas generator in order to provide a controlled interior atmosphere in each of the electrolyzer and the hydrogen and fluorine gas post-treatment processing sections.

Regarding claim 4, Tojo'105 further teaches a buffer tank(Fig. 1 numeral 44) and a pressurizer(Fig. 1 numeral 42). Even though the buffer tank(i.e. reservoir means) and the pressurizer of Tojo'105 are located outside of the box-shaped housing instead of within the second compartment as claimed and the pressurizer of Tojo'105 locates upstream of the buffer tank instead of downstream from the buffer tank as claimed, one

of ordinary skill in the art would have found the claimed reservoir and pressurizer locations obvious since it is well settled that rearrangement of parts is an obvious matter of design choice. In re Kuhle, 526 F.2d 553, 188 USPQ 7 (CCPA 1975). In addition, the buffer tank and the pressurizer of Tojo'105 differs from the instant invention only in their locations, which is unpatentable because shifting the locations of the buffer tank and the pressurizer of Tojo'105 would not have modified the operation of the buffer tank and the pressurizer. In re Japikse, 181 F.2d 1019, 86 USPQ 70 (CCPA 1950). See MPEP 2144.04. Furthermore, it would have been obvious to one of ordinary skill in the art to have incorporated the buffer tank and the pressurizer of Tojo'105 in view of Marumo and JP'390 inside the same compartment for post-treatment of fluorine gas discharge(i.e. second compartment) in order to protect the buffer tank and the pressizer from potentially hazardous environment and conditions.

Regarding claim 5, Tojo'105 teaches that a heater is used to provide proper heating of the electrolytic cell and the heater make take any form(col. 6 lines 53-67). Even though Tojo'105 in view of Marumo and JP'390 do not explicitly teach that the heater is water heating device as claimed, one of ordinary skill in the art would have found it obvious to have used an water heating device in the heater of Tojo'105 in view of Marumo and JP'390 since an water heating device is an well known low cost heating device.

Regarding claim 6, even though Tojo'105 in view of Marumo and JP'390 do not explicitly teach that the electrolyzer is mounted on a transporting member, one of ordinary skill in the art would have found it obvious to have mounted the electrolytic cell

of Tojo'105 in view of Marumo and JP'390 on a transporting member capable of moving the electrolytic cell in and out of the fluorine gas generator in order to allow easy access to the electrolytic cell for routine maintenance such as cleaning and replacement of parts.

Regarding claims 7-8, the adsorption unit of Tojo'105 in view of Marumo and JP'390 comprises two adsorption columns and can be operated alone as claimed. In addition, even though Tojo'105 in view of Marumo and JP'390 do not explicitly teach that the adsorption columns are mounted on transporting members as claimed, one of ordinary skill in the art would have found it obvious to have mounted the adsorption columns of Tojo'105 in view of Marumo on transporting members capable of moving the adsorption columns in and out of the first and second compartments in order to allow easy access to the adsorption columns for routine maintenance such as cleaning and replacement of parts.

7. Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 01/77412 in view of Marumo et al. US 4,790,859(Marumo), and further in view of Tseng et al. US 6,656,334 B2(Tseng).

The teachings of Tojo'105 in view of Marumo are discussed in paragraph 6 above. However, Tojo'105 in view of Marumo do not explicitly teach the at least three compartments for separately housing the electrolyzer and the adsorption units

Tseng teaches an electrolysis apparatus comprising three different compartments. The first compartment houses an electrolyzer. The second

compartment houses a filter system. The third compartment houses the remaining components of the electrolysis apparatus(col. 3 lines 28-38).

Regarding claims 1-2, one of ordinary skill in the art would have found it obvious to have incorporated the separate compartments as taught by Tseng into the apparatus of Tojo'105 in view of Marumo to separately house the electrolyzer, the first and the second adsorption units in order to allow easy access to different parts of the electrolysis apparatus for facilitating the component replacement as taught by Tseng(col. 1 line 66 – col. 2 line 6).

The remaining claim limitations are rejected for the same reasons as stated in paragraph 6 above.

Response to Arguments

8. Applicant's arguments filed 13 October 2006 have been considered but are not persuasive.

Applicant argues that the Final Office Action does not disclose any prior art in which a fluorine gas generator is split into three different compartments as claimed. In addition, JP'390, at best, supports housing the electrolyzer of Tojo'105 separately not. JP'390 does not suggest housing the electrolyzer, the first adsorption unit and the second adsorption unit separately as claimed.

The examiner respectfully disagrees. JP'390 teaches separately housing an electrochemical device such as an electroplating unit and a control system for the electrochemical device to avoid contamination to one major component of the apparatus, such as the electroplating unit, during maintenance operations of another

major component of the apparatus, such as the control system. The fluorine gas generator of Tojo'105 in view of Marumo would have also been concerned with the same potential cross-contamination issues during maintenance work on the electrolyzer, the first and/or the second adsorption units. Therefore, one of ordinary skill in the art would have found it obvious to provide separate housing for the major components of the fluorine generator of Tojo'105 in view of Marumo in order to eliminate the potential contamination of one major component, for example the first adsorption unit, while other one or two major components, for example, the electrolyzer and the second adsorption unit, are undergone maintenance as suggested by JP'390. Therefore, the examiner maintains that the combination of Tojo'105, Marumo and JP'390 is proper.

Regarding applicant's remaining arguments, the examiner does not find applicant's arguments persuasive for the same reasons stated in the rejections of claims 3-8 above.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Tseng et al. US 6,656,334 B2(Tseng) teaches an electrolysis cell comprising a compartment for housing the electrolysis cell and other compartments for housing other components of the electrolysis system.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lois Zheng whose telephone number is (571) 272-1248. The examiner can normally be reached on 8:30am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

LLZ

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SUPERVISORY PATENT
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